

## Agricultural Chemical Usage

Michigan statistics for on-farm use of agricultural chemicals are from the 2010 Vegetable Chemical Use Survey conducted by USDA, NASS for 29 vegetable crops in nineteen states. Chemical use statistics for other states and pest management practices are available online at: [www.nass.gov/Statistics\\_by\\_Subject/Environmental/](http://www.nass.gov/Statistics_by_Subject/Environmental/)

The fertilizer and chemical use statistics for corn and potatoes in Michigan are from the 2010 Agricultural Resource Management Survey. Other information on fertilizer and chemical use on corn and potatoes are also available on the NASS website.

### Asparagus: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	Pounds
<b>Herbicides</b>					
2,4-D, dimeth. salt	48	1.4	0.791	1.079	5,500
Clethodim	3	1	0.119	0.119	( <sup>2</sup> )
Diuron	85	1.6	1.259	1.952	17,800
Glyphosate iso. salt	91	1.6	0.771	1.243	12,100
Halosulfuron	24	1.1	0.03	0.034	100
Metribuzin	41	1.2	0.584	0.702	3,000
Sulfentrazone	24	1.3	0.137	0.177	500
Terbacil	6	1	0.732	0.732	500
<b>Insecticides</b>					
Carbaryl	83	2.9	1.11	3.238	28,800
Chlorpyrifos	49	1.3	0.842	1.118	5,900
Permethrin	39	2.5	0.108	0.268	1,100
<b>Fungicides</b>					
Chlorothalonil	59	2.7	1.316	3.543	22,500
Tebuconazole	16	1.6	0.12	0.192	300

<sup>1</sup> Planted acres in 2010 were 10,700 acres.

<sup>2</sup> Total applied was less than 50 lbs.

### Snap Beans, Processing: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
<b>Herbicides</b>					
Bentazon	78	1	0.628	0.628	7,200
Fomesafen	13	1	0.132	0.132	300
Imazamox	31	1	0.032	0.032	100
S-Metolachlor	81	1.3	1.707	2.201	26,300
Trifluralin	26	1	0.522	0.522	2,000
<b>Insecticides</b>					
Acephate	53	1.1	0.744	0.844	6,600

<sup>1</sup> Planted acres in 2010 were 14,800 acres.

### Carrots, Fresh: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied Percent	Applications Number	Rate per application Pounds per acre	Rate per crop year Pounds per acre	Total applied 1,000 lbs
Insecticides					
Carbaryl	5	2.2	0.99	2.179	200
Esfenvalerate	33	3.2	0.024	0.078	100
Fungicides					
Chlorothalonil	88	1.7	1.377	2.31	4,300

<sup>1</sup> Planted acres in 2010 were 2,100 acres.

### Sweet Corn, Fresh: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied Percent	Applications Number	Rate per application Pounds per acre	Rate per crop year Pounds per acre	Total applied 1,000 lbs
Herbicides					
2,4-D, dimeth. salt	2	1	0.392	0.392	100
Atrazine	79	1	0.881	0.886	7,000
Bentazon	23	1	0.55	0.55	1,300
Glyphosate iso. salt	2	1	1.075	1.075	300
Mesotrione	20	1	0.125	0.125	300
Pendimethalin	11	1	0.603	0.603	600
S-Metolachlor	67	1	1.199	1.199	8,100
Insecticides					
Carbaryl	3	2	1.128	2.286	600
Chlorpyrifos	7	1.3	0.755	0.958	600
Cyfluthrin	11	1.8	0.028	0.05	100
Esfenvalerate	25	2.4	0.035	0.083	200
Lambda-cyhalothrin	47	3	0.023	0.069	300
Methomyl	29	1.9	0.413	0.776	2,200
Permethrin	10	2.1	0.122	0.261	300
Thiodicarb	16	2.5	0.737	1.869	3,000
Zeta-cypermethrin	6	2.4	0.019	0.045	( <sup>2</sup> )
Fungicides					
Chlorothalonil	6	1.9	1.312	2.469	1,500
Mancozeb	4	1.2	1.274	1.482	500
Propiconazole	11	1.4	0.101	0.144	200

<sup>1</sup> Planted acres in 2010 were 10,000.

<sup>2</sup> Total applied was less than 50 lbs.

### Cucumbers, Fresh: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
<b>Herbicides</b>					
Clomazone	14	1	0.179	0.179	100
Ethalfluralin	63	1	0.562	0.562	1,500
Halosulfuron	53	1	0.024	0.024	100
<b>Insecticides</b>					
Carbaryl	1	2.4	0.941	2.266	100
Esfenvalerate	14	5.2	0.041	0.215	100
Lambda-Cyhalothrin	2	1.8	0.022	0.039	( <sup>2</sup> )
Permethrin	58	2.9	0.15	0.432	1,100
<b>Fungicides</b>					
Azoxystrobin	5	1.1	0.175	0.2	( <sup>2</sup> )
Chlorothalonil	96	4.1	2.018	8.309	34,200
Copper hydroxide	79	3.1	0.903	2.767	9,400
Cymoxanil	83	1.9	0.122	0.237	800
Famoxadone	83	1.9	0.122	0.237	800
Fluopicolide	8	1.5	0.125	0.184	100
Mancozeb	5	2.3	1.554	3.62	700
Myclobutanil	2	1	0.096	0.097	( <sup>2</sup> )
Propamocarb hydroch.	76	1.2	0.819	1.02	3,300

<sup>1</sup> Planted acres in 2010 were 4,300 acres.

<sup>2</sup> Total applied was less than 50 lbs.

### Cucumbers, Pickles: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
<b>Herbicides</b>					
Clomazone	59	1	0.185	0.185	3,500
Ethalfluralin	67	1	0.332	0.332	7,100
Halosulfuron	59	1	0.016	0.016	300
<b>Fungicides</b>					
Chlorothalonil	94	2.6	0.92	2.362	71,300
Copper hydroxide	46	1	0.355	0.365	5,300
Cymoxanil	83	1.2	0.125	0.151	4,000
Famoxadone	83	1.2	0.125	0.151	4,000
Mancozeb	78	1.6	1.949	3.149	79,100
Propamocarb hydroch.	95	1.6	0.768	1.235	37,600

<sup>1</sup> Planted acres in 2010 were 32,000.

### Pumpkins: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
<b>Herbicides</b>					
Clomazone	44	1	0.301	0.303	1,000
Ethalfluralin	29	1	1.01	1.02	2,200
Glyphosate iso. salt	18	1	1.044	1.044	1,400
Halosulfuron	14	1	0.032	0.032	( <sup>2</sup> )
S-Metolachlor	28	1	1.036	1.036	2,200
<b>Insecticides</b>					
Bifenthrin	11	2.9	0.044	0.127	100
Carbaryl	10	2	0.989	1.962	1,400
Cyfluthrin	1	1.4	0.041	0.059	( <sup>2</sup> )
Esfenvalerate	21	2	0.034	0.07	100
Imidacloprid	2	1.2	0.152	0.187	( <sup>2</sup> )
Lambda-cyhalothrin	7	2.4	0.022	0.052	( <sup>2</sup> )
Zeta-Cypermethrin	2	2.7	0.018	0.048	( <sup>2</sup> )
<b>Fungicides</b>					
Azoxystrobin	19	1.4	0.138	0.196	300
Boscalid	13	1.2	0.011	0.014	( <sup>2</sup> )
Chlorothalonil	74	2.6	1.26	3.272	18,000
Copper hydroxide	51	2.8	0.559	1.589	6,000
Cymoxanil	20	1.4	0.123	0.175	300
Famoxadone	20	1.4	0.123	0.175	300
Myclobutanil	21	2	0.08	0.159	300
Propamocarb hydroch.	12	1.5	0.665	0.992	900
Pyraclostrobin	16	1.8	0.053	0.095	100
Thiophanate-methyl	20	1.6	0.23	0.359	500
Trifloxystrobin	7	2.1	0.083	0.176	100

<sup>1</sup> Planted acres in 2010 were 7,400.

<sup>2</sup> Total applied was less than 50 lbs.

### Squash: Agricultural chemical applications, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 lbs
<b>Herbicides</b>					
Clethodim	7	1	0.115	0.115	100
Clomazone	54	1	0.26	0.269	1,000
Ethalfluralin	65	1	0.796	0.803	3,500
Glyphosate iso. salt	10	1.1	1.03	1.082	700
Halosulfuron	18	1	0.032	0.033	( <sup>2</sup> )
S-Metolachlor	5	1	1.099	1.118	400
<b>Insecticides</b>					
Carbaryl	13	1.7	0.918	1.523	1,400
Cyfluthrin	6	6.9	0.037	0.26	100
Endosulfan	8	1.5	0.668	0.996	500
Esfenvalerate	18	3.5	0.039	0.136	200
Imidacloprid	7	1	0.248	0.248	100
Lambda-cyhalothrin	6	1.6	0.02	0.033	( <sup>2</sup> )
Permethrin	23	2.7	0.167	0.457	700
<b>Fungicides</b>					
Azoxystrobin	4	1.8	0.188	0.331	100
Boscalid	14	3.6	0.017	0.061	100
Chlorothalonil	74	3.5	1.367	4.791	23,600
Copper hydroxide	41	2.3	0.433	1.008	2,700
Cymoxanil	16	3.6	0.123	0.443	500
Famoxadone	16	3.6	0.123	0.443	500
Myclobutanil	26	2	0.104	0.206	400
Propamocarb hydroch.	7	1.9	0.786	1.47	700
Pyraclostrobin	24	2.5	0.022	0.057	100
Thiophanate-methyl	10	1.8	0.318	0.573	400

<sup>1</sup> Planted acres in 2010 were 6,700 acres.

<sup>2</sup> Total applied was less than 50 lbs.

### Fertilizer applications: Corn, 2010<sup>1</sup>

Fertilizer	Symbol	Area applied	Applications	Rate per application	Rate per crop year	Total applied
		Percent	Number	Pounds per acre	Pounds per acre	Million pounds
<b>Nitrogen</b>						
Nitrogen	N	99	2.1	58	122	289
Phosphate	P <sub>2</sub> O <sub>5</sub>	93	1.4	24	32	72
Potash	K <sub>2</sub> O	83	1.3	73	94	187
Sulfur	S	35	1	5	5	5

<sup>1</sup> Planted acres in 2010 were 2.40 million acres.

### Agricultural chemical applications: Corn, 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 pounds
<b>Herbicides:</b>					
Acetochlor	25	1	1.242	1.242	730
Atrazine	55	1	0.794	0.794	1,045
Dimethenamid-P	4	1	0.582	0.582	61
Glyphosate iso. Salt	54	1.2	0.932	1.113	1,439
Glyphosate Pot. Salt	2	1	0.981	0.981	40
Mesotrione	22	1	0.129	0.129	69
S-Metolachlor	21	1	1.232	1.232	632

<sup>1</sup> Planted acres in 2010 were 2.40 million acres.

### Fertilizer applications: Fall potatoes, 2010<sup>1</sup>

Fertilizer	Symbol	Area applied	Applications	Rate per application	Rate per crop year	Total applied
		Percent	Number	Pounds per acre	Pounds per acre	Million pounds
Nitrogen	N	100	4.4	44	195	8.6
Phosphate	P <sub>2</sub> O <sub>5</sub>	98	1.7	46	80	3.5
Potash	K <sub>2</sub> O	100	2.1	91	196	8.6

<sup>1</sup> Planted acres in 2010 were 44,000 acres.

### Agricultural chemical applications: Fall potatoes 2010<sup>1</sup>

Agricultural chemical	Area applied	Applications	Rate per application	Rate per crop year	Total applied
	Percent	Number	Pounds per acre	Pounds per acre	1,000 pounds
<b>Herbicides</b>					
Linuron	67	1.0	0.598	0.598	18,000
Metribuzin	35	1.0	0.139	0.139	2,000
Rimsulfuron	42	1.5	0.019	0.028	1,000
S-Metolachlor	41	1.0	1.243	1.243	22,000
<b>Insecticides</b>					
Cyfluthrin	55	1.5	0.027	0.040	1,000
Esfenvalerate	28	1.6	0.031	0.049	1,000
Imidacloprid	78	1.2	0.091	0.109	4,000
Phosmet	3	1.1	0.716	0.780	1,000
<b>Fungicides</b>					
Azoxystrobin	11	1.8	0.105	0.191	1,000
Chlorothalonil	83	5.6	0.791	4.417	162,000
Cymoxanil	39	1.6	0.114	0.182	3,000
Famoxadone	39	1.6	0.114	0.182	3,000
Mancozeb	60	3.3	1.219	4.019	107,000
<b>Other chemicals</b>					
Diquat dibromide	67	1.6	0.371	0.582	17,000

<sup>1</sup> Planted acres in 2010 were 44,000 acres.

### Commercial fertilizer consumption: 2005-2009<sup>1</sup>

Item	Year ending June 30				
	2005	2006	2007	2008	2009
	Short tons	Short tons	Short tons	Short tons	Short tons
Primary plant nutrients					
Total N	253,433	232,710	268,566	241,823	193,784
N in multi-nutrients	57,559	58,308	53,231	44,373	42,960
Total P <sub>2</sub> O <sub>5</sub>	82,885	85,746	81,110	74,767	52,628
P <sub>2</sub> O <sub>5</sub> in multi-nutrients	81,187	83,841	80,132	74,219	51,403
Total K <sub>2</sub> O	189,432	163,523	184,571	173,104	112,820
K <sub>2</sub> O in multi-nutrients	41,926	36,883	28,060	24,902	26,037
Total plant nutrients	525,751	481,979	534,247	489,694	359,232
Average analysis	37.7	41.3	41.1	40.8	41.1
Total nutrients in multi-nutrients	180,673	179,031	161,423	143,494	120,400
Selected single-nutrient materials					
Ammonium nitrate	7,501	5,168	2,899	3,085	2,860
Anhydrous ammonia	50,071	33,759	45,245	38,983	28,078
Nitrogen solutions	301,868	279,293	367,967	302,401	250,297
Urea	108,090	107,941	118,448	137,423	93,397
Ammonium sulfate	36,660	30,254	44,904	35,860	25,863
Concentrated superphosphate	3,716	4,189	1,866	945	1,323
Potassium chloride	234,700	203,398	250,800	235,815	136,370
Multiple-nutrient fertilizers					
N-P-K	227,081	245,713	205,901	198,596	133,333
N-P	134,719	143,185	147,526	131,150	90,873
N-K	44,437	56,456	59,737	60,093	56,138
P-K	2,926	2,536	1,934	592	3,291
Leading multiple-nutrient grades					
10-34-0	37,026	47,687	52,204	44,409	22,181
11-52-0	35,776	35,295	35,713	42,688	21,927
18-46-0	38,902	39,534	39,568	25,550	15,401
15-15-15	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	6,095
28-0-3	( <sup>2</sup> )	( <sup>2</sup> )	4,680	7,774	5,700
Fertilizer consumption by classes					
Dry bulk single-nutrient	430,495	380,147	442,432	429,052	288,748
Dry bagged single-nutrient	19,815	18,688	21,017	20,665	14,421
Fluid single-nutrient	362,722	319,143	422,173	358,642	287,842
Dry bulk multiple-nutrient	202,878	214,164	156,861	134,348	139,855
Dry bagged multiple-nutrient	137,291	145,636	160,428	155,401	85,689
Fluid multiple-nutrient	68,993	88,090	97,809	100,681	58,091
Organics, secondary and micronutrients	58,519	148,112	134,015	150,999	244,014
Total	1,280,715	1,313,980	1,434,734	1,349,788	1,118,661

<sup>1</sup> Source: The Association of American Plant Food Control Officials.

<sup>2</sup> Grade not published.